

REMARKS

Applicants note that in the Interview Summary, and by the communication dated July 14, 2006, the Examiner corrected the Office Action dated June 6, 2006 to correctly identify the patent number of the cited reference of Gupta et al, as indicated in the Interview Summary.

By the present amendment, claims 1 - 4, which stand withdrawn from consideration, have been canceled without prejudice or disclaimer of the subject matter thereof, and without prejudice to the right to file a divisional application directed thereto, with independent claim 5 being amended to incorporate the features of dependent claims 6 and 7 therein, and independent claim 8 being amended to incorporate the features of dependent claim 10 therein. Additionally, claim 5 has been further amended in a manner which is considered to overcome the rejection under 35 USC 112, first paragraph, as will be discussed below. Applicants note that claims 6, 7 and 10 have been canceled, and new dependent claims 12 and 13 have been presented which depend from claims 5 and 8 respectively, noting that the total number of claims remain the same. Applicants submit that the amendments do not raise new issues requiring further search and/or consideration, and that the newly added claims should be considered allowable with the parent claims, as will be discussed below.

As to the rejection of claims 5 - 11 under 35 USC 112, first paragraph with regard to the recitation of "exhaustion means", the rejection is traversed insofar, as it is applicable to the present claims.

At the outset, applicants note that claim 8 and its dependent claims do not recite the feature of "exhaustion means", such that the rejection under 35 USC 112,

first paragraph, in relation to claim 8 and its dependent claims is considered to be improper.

With respect to claim 5 and its dependent claims which recite the feature of "exhaustion means", in view of the Examiner's indication that the "exhaustion means" is not elaborated sufficiently to meet first and sixth paragraph requirements, by the present amendment, independent claim 5 has been amended to recite the feature of "exhaustion means for exhausting the processing chamber by a turbo-molecular pump through an exhaust passage equipped with a butterfly valve". This feature is illustrated in Fig. 1, for example, and described at page 10, lines 10 - 12 of the specification, which provides that "The processing chamber 1 is continuously exhausted by the use of a turbo-molecular pump or the like through an exhaust passage 8 where the exhaust rate is adjusted by a butterfly valve 9." Thus, applicants submit that the amendment does not raise new issues requiring further search and/or consideration and is responsive to the rejection as set forth by the Examiner noting that applicants consider that the specification and drawings, as discussed above, to provide an adequate support for the recitation of "exhaustion means", in accordance with 35 USC 112.

As to the rejection of claims 5 - 11 under 35 USC 103(a) as being unpatentable over Tsukazaki et al (US 5,837,094A) in view of Gupta et al (US 6,125,789, as corrected in the Communication dated July 14, 2006), this rejection is traversed, insofar as it is applicable to the present claims, and reconsideration and withdrawal of the rejection are respectfully requested.

Turning to claim 5, as amended to incorporate the features of dependent claims 6 and 7 therein, claim 5 now recites a particle detector having a laser scanner and a detector which are installed outside of the processing chamber, the laser

scanner introducing a laser from outside the processing chamber to inside of the processing chamber through a measurement window so as to scan a laser beam in a plane inside of the processing chamber and outside of a region where the plasma is generated, and the detector detecting light which is scattered from a particle crossing the plane while the laser beam scans in the plane and which passes through the measurement window. That is, as shown in Fig. 3 of the drawings, for example, and as described at page 10 of the specification, a measurement window 10 is provided at an opening formed on a wall in a passage extending from the processing chamber 1 serving as the vacuum reactor, to the exhaust passage 8 and a particle detector 11 is provided so as to scan laser light using a scanner, such as a galvano mirror in a scanning region 19 through the measurement window 10 and detects scattered light through the measurement window 10. Thus, the particle detector 11 includes a laser scanner and a detector arranged at substantially the same position outside of the processing chamber, so as to enable the laser to be introduced through the measurement window into the processing chamber and to receive detected light through the same measurement window, as previously set forth in the dependent claims, and as now set forth in independent claim 5.

Applicants note that claim 8 has been amended in a similar manner to recite the feature that the particle detecting unit introduces the laser beam from outside of the processing chamber to inside of the processing chamber through a measurement window, and monitors the light scattered from the particle crossing the plane inside of the processing chamber and passing outside of the processing chamber through the measurement window. Hereagain, the feature as now recited in claim 8 corresponds to that previously set forth in dependent claim 10, which has been cancelled.

In applying Tsukazaki et al to the claimed invention, the Examiner contends in paragraphs ii and iii, at pages 3 and 4 of the Office Action that Tsukazaki et al discloses a particle detector 15 which detects light scattered from a particle wherein the laser 15a is introduced from outside the processing chamber through the measurement window (paragraph ii), and a scattered light is detected through the measurement window, as claimed by claim 7 (paragraph iii). Applicants submit that the Examiner has mischaracterized the disclosure of Tsukazaki et al in relation to the claimed invention. That is, as illustrated in connection with Fig. 3 of Tsukazaki et al, a particle monitor 15 includes a laser irradiation system 15a and both arranged at one side with respect to an exhaust pipe 12 which exhausts a gas in a process chamber 4, and another window 15d together with a detector 15b, both arranged at an opposite side of the exhaust pipe 12. As such, Tsukazaki et al fails to disclose or teach a particle detector having a laser scanner and a detector installed outside of the processing chamber, wherein the laser scanner introduces a laser from outside of the processing chamber to inside of the processing chamber through a measurement window (window 10 of Fig. 3 of this application), so as to scan a laser beam in a plane inside of the processing chamber and outside of a region where the plasma is generated, and wherein the detector detects light scattered from a particle which crosses the plane while the laser beam scans in the plane, and which detected light passes through the measurement window, i.e., the same measurement window, i.e., through which the laser is introduced into the processing chamber, as recited in claim 5 and similarly recited in claim 8. Applicants further submit that in addition to Tsukazaki et al disclosing the utilization of two separate windows (15c and 15d) arranged at positions spaced from one another, Tsukazaki et al detects scattered light which is not introduced into the processing chamber 4, but

rather is introduced into an exhaust pipe 12, which exhausts gas from the processing chamber. Thus, applicants submit that claims 5 and 8 recite features not disclosed or taught by Tsukazaki et al in the sense of 35 USC 103, and all claims patentably distinguish thereover.

In this regard, the Examiner has recognized some deficiencies of Tsukazaki et al as listed at the top of page 6 of the Office Action. In an attempt to overcome these acknowledged deficiencies, the Examiner cites Gupta et al for teaching a laser system utilizing a laser scanner, with the Examiner contending that it would have been obvious to one of ordinary skill in the art at the time the invention was made to add Gupta's laser scanner (335; Fig. 3B) to Tsukazaki's particle detector (15; Fig. 3; col. 1, lines 44 - 59). Irrespective of the contentions by the Examiner, applicants submit that, as illustrated in Fig. 3B of Gupta et al, and as pointed out at column 8, lines 33 - 40, laser light from a laser 330 is directed through a scanner 335 that spreads the laser light and directs the laser light along a light path 340 entering chamber 15 through a first window 341 in chamber wall 15a, scattering off of particles 300 and exiting through a second window 343. The scattered light is then detected using a photosensor apparatus 345. As is illustrated in Fig. 3B of Gupta et al, the laser scanner 335 is arranged at one position with respect to the chamber 15 for introducing laser light through the first window 341, and the photosensor apparatus 345 is arranged at a substantially different and opposite position from the laser scanner 335 with respect to the chamber 15 for receiving light through a second window 343. Thus, it is readily apparent that Gupta et al, like Tsukazaki et al, discloses the utilization of a laser scanner 335 arranged with respect to one window 341 in a wall of a processing chamber for introducing light from outside of the processing chamber, into the inside of the processing chamber, and a sensor

345 and second window 343, arranged at a substantially opposite position with respect to the laser scanner and the first window, for receiving scattered light passing through the second window. Thus, it is readily apparent that the combination of Gupta et al and Tsukazaki et al fail to provide the same measurement window through which laser light is introduced from outside the processing chamber to the inside thereof and through which scattered light from the inside of the processing chamber is received through the same measurement window for detection by a detector arranged at substantially the same position of the laser scanner, or wherein the detector unit is arranged at the same position with respect to the measurement window and processing chamber. Thus, applicants submit that claims 5 and 8 and the deponent claims thereof patentably distinguish over this proposed combination of references in the sense of 35 USC 103, and all claims should be considered allowable thereover.

Applicants note that the dependent claims recite further features of the present invention as described above. With respect to the Examiner's contention that the claim requirement of "and plasma is generated after the processing chamber has been evacuated, is a claim requirement of intended use, applicants submit that such claim further defines the structural features of the present invention and must be given consideration. See, for example, MPEP §2173.05(g). Again, it is noted that the newly added dependent claims 12 and 13 further recite features the structural arrangement, as discussed above, which is not disclosed or taught in the cited art. Accordingly, applicants submit that independent claims 5 and 8 as amended, and the dependent claims patentably distinguish over the cited art and should now be in condition for allowance.

In view of the above amendments and remarks, applicants request favorable action in this application.

To the extent necessary, applicants petition for an extension of time under 37 CFR 1.136. Please charge any shortage in the fees due in connection with the filing of this paper, including extension of time fees, to the deposit account of Antonelli, Terry, Stout & Kraus, LLP, Deposit Account No. 01-2135 (Case: 501.43537X00), and please credit any excess fees to such deposit account.

Respectfully submitted,

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